



**f.r. mahony & associates inc.** **water and wastewater technologies**  
**frma** *Featuring*  
273 Weymouth Street • Rockland MA 02370

**Now representing E/One in the six New  
England States.**

D Series and IH indoor Certified  
Installation

**ENVIRONMENT ONE**



# INTRODUCTION

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- × Who we are.
  - + F. R. Mahony
  - + Environment One

- Overview
  - Pressure Sewers
  - Pump Options
- Inspection –
  - Before you begin
  - Keys to proper Installation
- Bedding/Foundation
- Ballasting
- Installing/Placing the Station
- Piping
  - Inlet
  - Discharge
- Backfill
- Height Adjustment
  - Flood Plain Covers
- Indoor Pump
- Electrical
  - Indoor Panel
    - Wiring
  - Outdoor Panels
    - Wiring
- Startup Inspection



# WHAT TO EXPECT



water supply and pollution control equipment

tel. 781.982.9000  
fax. 781.982.1056  
info@frmahony.com  
www.frmahony.com

March 4, 2016

Greetings:

This is to confirm that **John Q. Installer**  
has attended **E/One Certified Installer Training**

Given on March 2, 2016 in Falmouth, MA

This course was a 4.0 hour training sponsored by

F. R. Mahony & Associates, Inc. in cooperation with:



A PCC Flow Technologies, Inc. Company

Respectfully,

*Henry Albro*

F. R. Mahony & Associates, Inc.

273 Weymouth Street  
Rockland, MA 02370  
tel. 781.982.9300  
fax. 781.982.1056

30 DuPaul Street  
Southbridge, MA 01550  
tel. 508.765.0051  
fax. 508.765.1244

41 Bayberry Hill Road  
West Townsend, MA 01474  
tel. 978.597.0703  
fax. 978.597.0704

140 Country Walk Road  
Schenectady, NY 12306  
tel. 774.402.0354  
fax. 518.356.3266

- ✗ We provide a certificate of attendance.
- ✗ We expect that you have learned the essentials of proper installation to make your installations successful.
- ✗ This does not take the place of any inspection of work required by permit, nor does it take the place of startup inspection.
- ✗ This does not take the place of regulatory licensing.

# PRESSURE SEWER OVERVIEW- SYSTEM

- ✖ Pressure sewer pumping has been a viable means of collecting and transporting wastewater for over 46 years.
- ✖ Environment One Corporation developed the worlds first grinder pump.
- ✖ Today E/One serves over two million end users in over 43 countries.
- ✖ Every day E/One connects 150 homes to sewer systems word wide.
- ✖ Projects range from single pump applications to over 16,000 pumps. *Mornington Peninsula for South East Water, Australia*

# ENVIRONMENT ONE CORPORATION

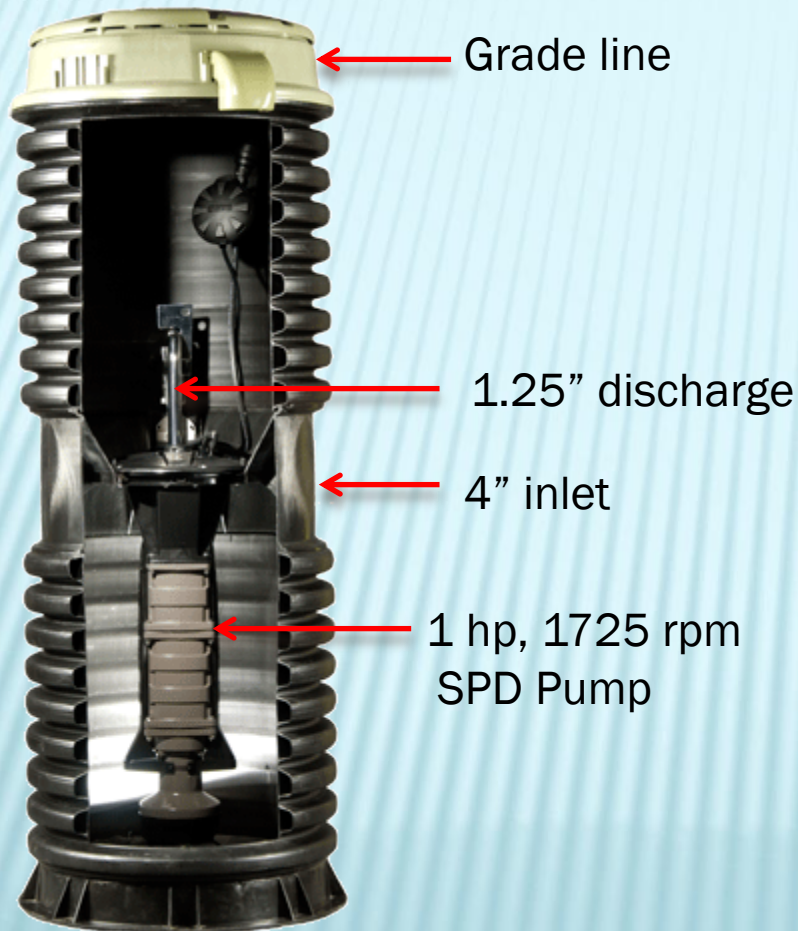
- ✖ Niskayuna, NY (Suburb of Albany) for 46 years
- ✖ Distribution through designated supply/channel partners
- ✖ E/One is engineered product/*system*
- ✖ Local representation through F. R. Mahony & Associates, Inc., Rockland, MA for 39 years.
  - + Complete design, sales and service support in the New England Region



# WHY PRESSURE SEWER?

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- × Pressure Sewers offer a wide range of benefits.
  - + Lower cost compared to gravity
  - + Easier to install than gravity
    - × Shallow trenches
    - × Small diameter pipelines
    - × Less disruption to existing utilities
  - + Lower operating cost than gravity and pump stations
  - + Eliminate inflow and infiltration



- E/One's most flexible product line
- Capacities of 70 gallons to 500 gallons
- HDPE or fiberglass tanks
- Flood configuration available
- 1 to 4 pumps
  - Depends on tank





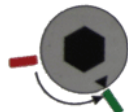
**IH -091**



PUMP EQUIPPED WITH QUICK RELEASE LATCH

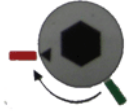
**DO NOT OVERTIGHTEN**

LATCH MOVES 1/3 TURN



OPEN

**E|ONE**  
**EXTREME**



LOCKED

- Sealed access to wet well for safety
- Core sits on a “deck” in the transition of the tank
- Uses a latch to lock the core in place
  - Lock & unlock with core wrench
- Sticker under station lid shows locked and unlocked positions



# BEFORE YOU BEGIN- INSPECTION



- What to look for
  - Check tanks for cracks, broken discharge connections, seam separation, etc.
  - Check Panel containers for external damage to the box.
  - Check Pump containers for external damage to the box
- Liability
  - Once you sign for it, you limit your ability to submit a claim for damages to the trucking company
- Storage
  - Cores, which may be shipped separately in some models, are stacked on pallets in cardboard boxes. Store cores in a dry area.

- What to look for on site
  - Verify house plumbing elevation
  - Does it match the station height and elevations?
    - Locate discharge at foundation
    - Measure to liquid level in existing septic tank
    - Follow design plan elevations – when provided
  - Verify house plumbing discharge
    - Line size
      - Typical pump inlet is 4-inch
    - Pipe material
      - Standard grommet inlet for SCHEDULE 40 PVC
    - Power supply
      - Verify power supply and capacity 240 volt, single phase



## BEFORE AND REGION-LEVEL CONNECTION





# KEYS TO PROPER INSTALLATION

- Do not drop, roll or lay stations on their side with the core installed in the basin
- Place the unit on a 6" level bed of naturally rounded  $\frac{1}{4}$ " to  $\frac{3}{4}$ " aggregate stone
- The unit must be leveled
- The proper amount of ballast (either poured in place or pre-cast) is mandatory for the soil conditions present
- Proper backfill and compaction are mandatory
- The basin must be properly vented
- Finished grade line to be 1 to 4 inches below lid and slope away from the station

# PUMP TRANSPORT & DELIVERY





# **SITE WORK – BEDDING AND BALLAST**





Bed your hole with a minimum of 6" of  $\frac{1}{4}$ " to  $\frac{3}{4}$ " aggregate stone

**What is missing here?**

- Assemble on site or prior to delivery.
- Provides 120% of ballast needs
- Reduces installation & dewatering time and costs
- Reduces inspection time and cost
- Installs in minutes so you can backfill immediately



Bal-Last® Precast Forms- Included in Falmouth Scope of Supply

[www.interlockingballast.com](http://www.interlockingballast.com)



# BAL-LAST INSTALLATION

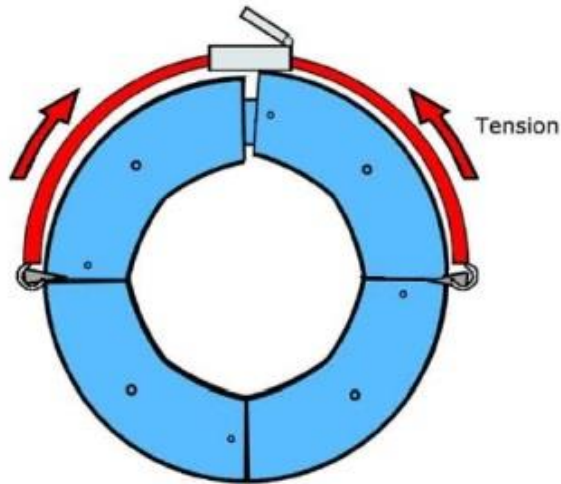
Blocks can be pulled together with the Bal-Last™  
tensioning strap





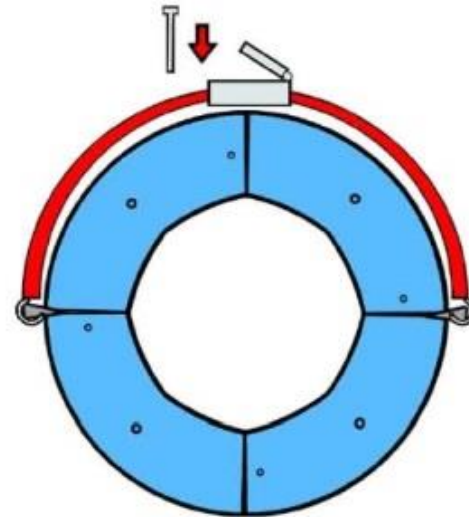
# BAL-LAST TENSIONING STRAP

Use nylon ratchet strap attached to holes in wedge plates to tension final Bal-Last joint inward until last locking pin can be tapped into place.

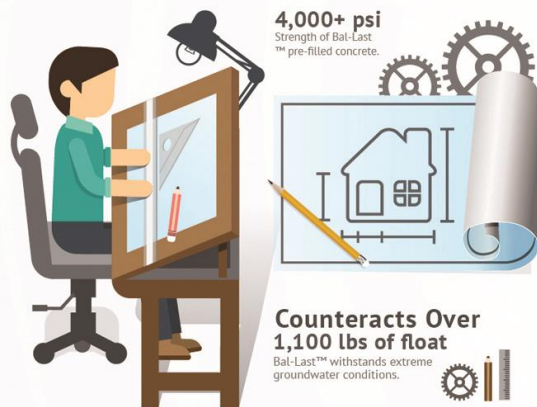


Insert final locking pin.

Remove ratchet and wedge plates before installing pump and ballast.



# Save **Time** and **Money** on Your Next **Grinder Pump** Install



**DON'T LET WEATHER  
RAIN ON YOUR PARADE**  
Weather can adversely affect the final strength of poured concrete.



**RAIN**  
Too much water in the mix can weaken concrete.



**HEAT**  
Heat can damage the integrity of concrete as it sets.



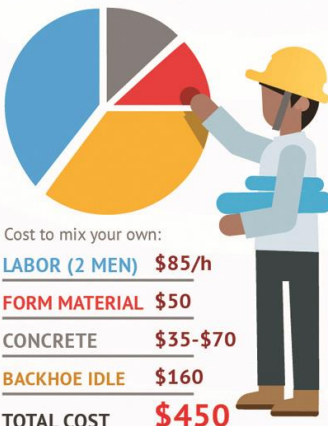
**COLD**  
Cold can prevent concrete from setting.



**SOIL**  
Regardless of the sky, the ground can be wet or frozen.



**SAVE  
20-40%**  
Over the cost of mixing your own concrete.



## EASY

**DROP-IN HARNESS**  
Install your pump with ballast already applied.



## SECURE

**PROTECT YOUR PUMP**  
Bal-Last™ is ideal for tricky soil conditions.



## FAST

**DON'T WAIT AROUND**  
Don't waste time waiting for the concrete truck.



## EXCEEDS

**MANUFACTURER REGULATIONS**  
For ALL station heights.

## FLEXIBILITY

**4 EXPANSION JOINTS**  
Moves with shifting soil for added strength.



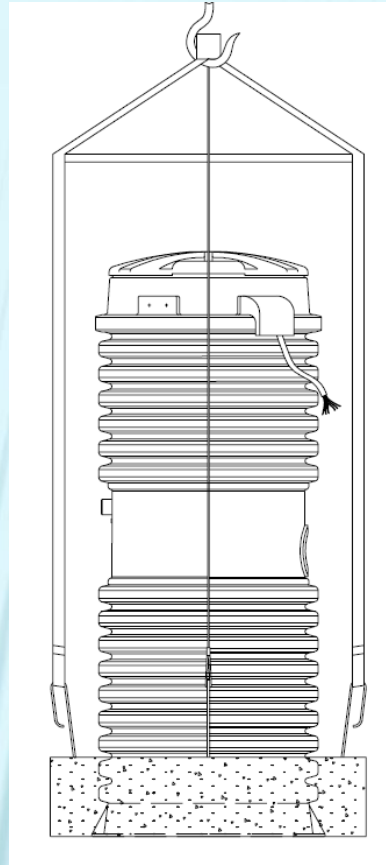
**LEARN MORE**

visit: [www.interlockingballast.com](http://www.interlockingballast.com) | email: [henry@interlockingballast.com](mailto:henry@interlockingballast.com)

# BALLASTING PRECAST FORMS



# PROPER STATION LIFTING



Use Bal-Last four point lifting eyebolts.



# LEVEL THE STATION



Ensure that the station is level  
**What did this guy overlook?**

# INLET AND DISCHARGE PIPING



# PIPE MATERIALS - CLASSIFICATION

## × Inlet Pipe

- + Typical inlet 4-inch SCHEDULE 40DWV PVC
  - × 6-inch grommets are available (option adder)
- + Additional Inlets
  - × Core in tank at 45 degree increments. Only in the smooth wall section.

## × Discharge Pipe

- + Outdoor Pump use:
  - × 1-1/4 inch SDR 11 HDPE PE4710 rated to 200 psi
- + Indoor Pump use:
  - × SCHEDULE 40 PW or SCHEDULE 80 PVC

## × Valves and fittings

- + Avoid brass waterworks fittings that are not rated for sewage application.
- + De-alloying- corrosion
- + Avoid ball check valves, spring loaded valves, waterworks brass.
- + Clogging



# PIPE BEDDING

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PIPE BEDDING

# BACKFILL UP TO PIPING

When do you need local inspection?



Due to some native soil conditions, it is recommended that you backfill with Class 1 material up to the discharge and inlet piping before you install them.

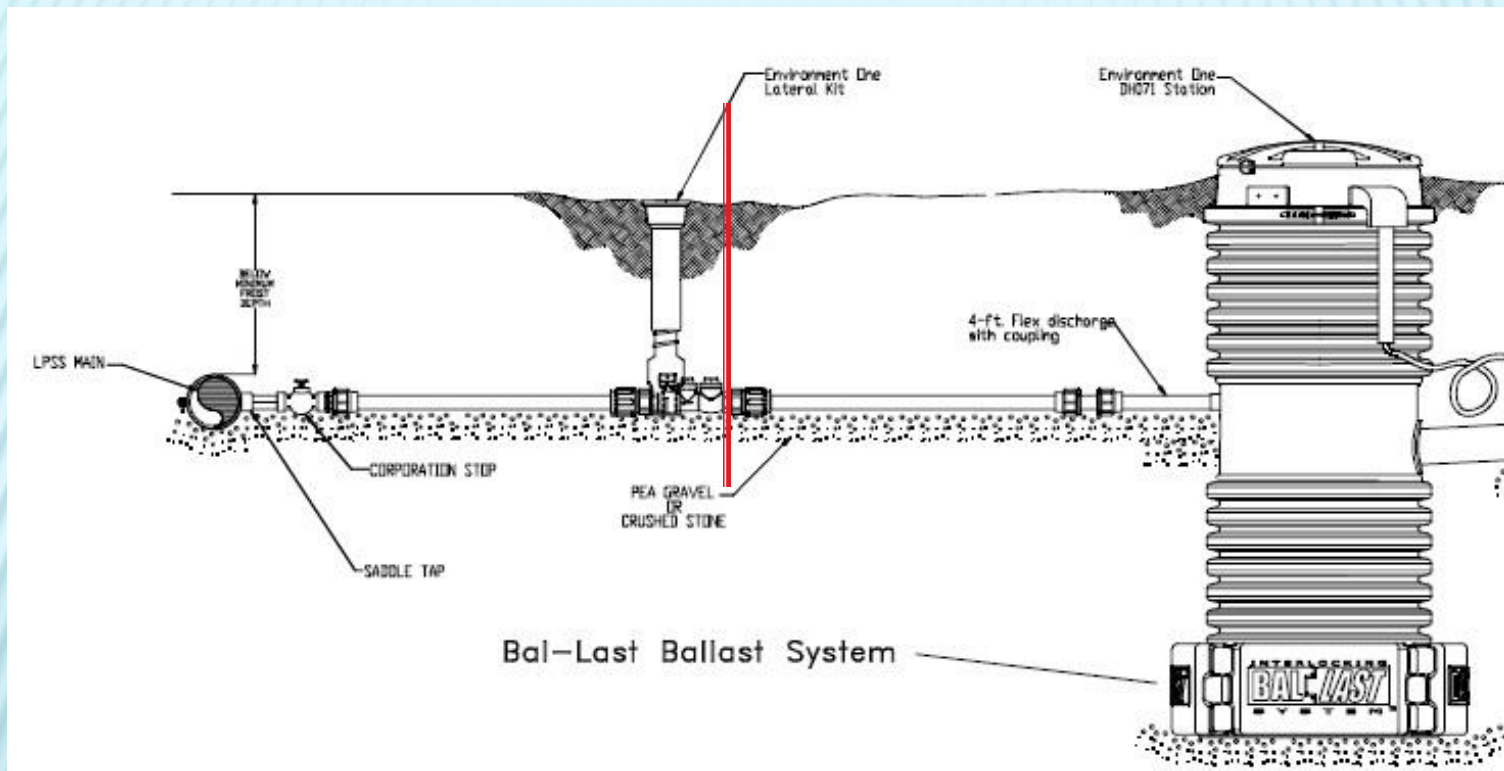


- Standard 4" SCH 40 pipe grommet supplied
  - Optional 4" or 6".
- Pipe end should be chamfered and lubricated with a soap solution
- Mark insertion depth of
- 3 ½" on O.D. of pipe
  - Do not exceed during installation of pipe into grommet





- Pipe should enter station straight and not at an angle
- If pipe is being stubbed out, it should be a minimum of 5' with a glued cap to seal the end
- The line should be bedded with crushed angular stone to minimize pipe deformation
- The bottom half of the line should be bedded at a minimum. The entire pipe is preferred



- It is **HIGHLY** recommended that a curb stop/redundant check valve be installed between the pump discharge and the street main.
- We recommend a sewage rated, pressure rated, full-port check valve



# LATERAL CONNECTION PROVIDED





# CONNECTION TO LATERAL



- Falmouth service laterals are capped off with temporary plug.
- Verify the lateral curb stop is closed before removing the temporary plug.
- Clean threads and install 'Compression' x Male IPT adapter with Teflon tape and/or paste as thread sealant.
- Install new service pipe (1-1/4 inch SDR 11 HDPE preferred) into 'Compression' fitting. (See following slides)
- **Definition:** Compression adapter = Split ring, restrained, bell and gasket fitting.



# DISCHARGE PIPE – ‘COMPRESSION’ COUPLING

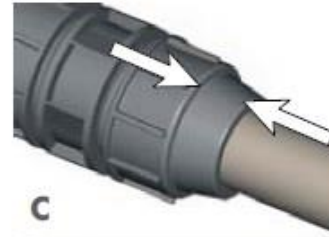
## Installation Instructions



**A**  
Cut pipe square with pipe cutters.  
Chamfer the pipe with the beveler tool.  
Apply neutral lubricant on pipe.



**B**  
Slacken the ring nut without removing from the body. Check that O-ring and split ring are in proper position.



**C**  
Insert the pipe end without tightening the nut.  
Push the fitting until the pipe stops at the O-ring and then push it past the O-ring until it reaches the next stop.



**D**  
Hand tighten the ring nut then tighten further with a strap / chain wrench.

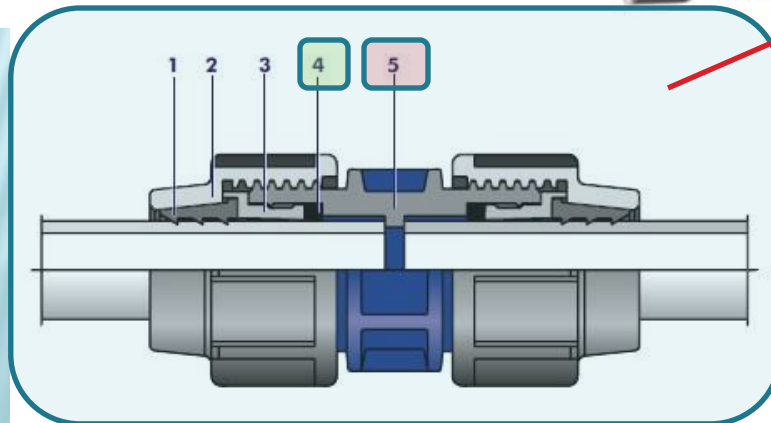
## Tools

We recommend these tools for proper installation:



Beveler

Insert Pipe past O-ring '4' until pipe hits internal stop '5'



## Parts

N°	Description	Material
1	Split Ring	Acetalic resin POM
2	Nut	Polypropylene PP
3	Pipe Guide	Polypropylene PP
4	O-Ring	Drinking water rubber NBR
5	Body	Polypropylene PP

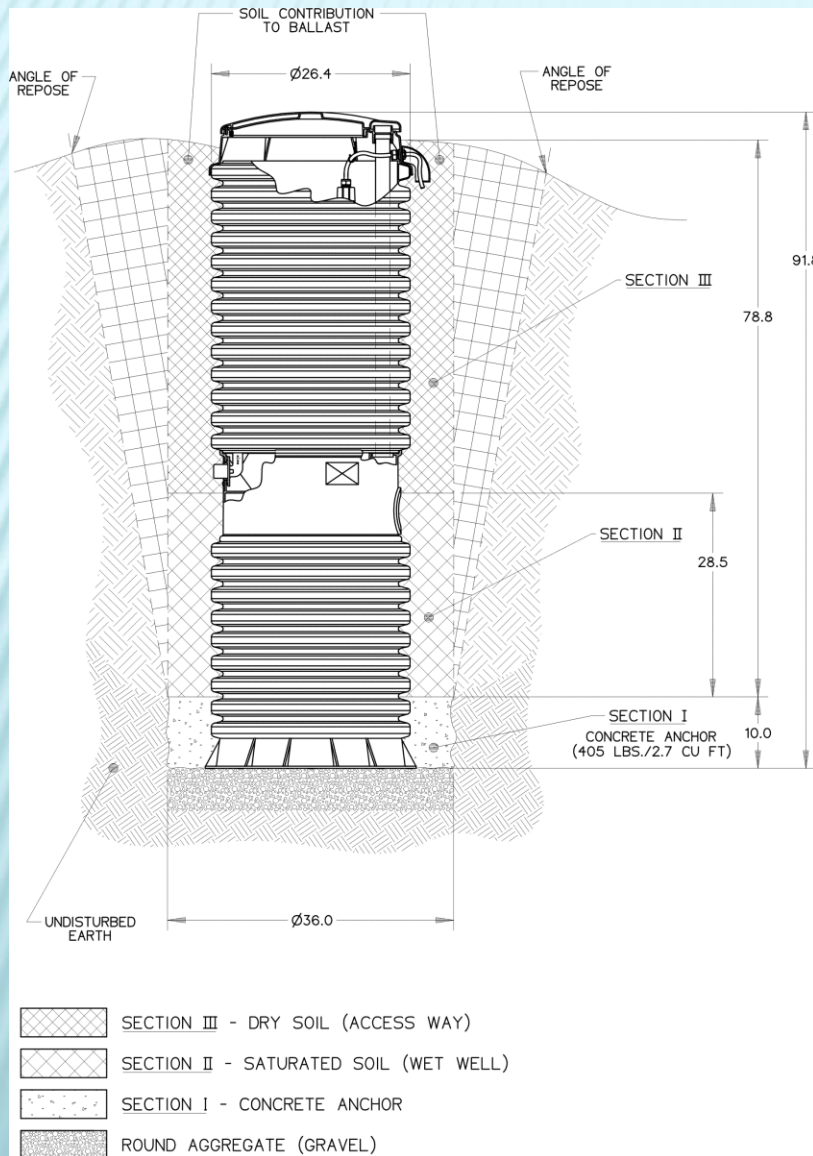
# DISCHARGE PIPE – DISCHARGE WHIP

- FRMA provides a 4 foot long discharge whip of 1-1/4 inch SDR 11 HDPE pipe with SS MIPT on one end and plain end pipe on the other.
- Also provided is a 'compression' coupling to connect to 1-1/4 or 1-1/2 inch lateral pipe (by others)





# STATION BACKFILL REQUIREMENTS



- The most highly recommended method of backfilling is to surround the unit to grade using Class I or Class II backfill material as defined in ASTM 2321
- Compact backfill in 1' lifts



Class	Description
Class 1A and 1B	Recommended where frost heave is a concern
Class 1B	A better choice when the native soil is sand or if a high, fluctuating water table is expected
Class II (naturally rounded stone)	May require more compactive effort (tamping) to achieve the proper density. If the native soil condition consists of clean, compactable soil, with less than 12% fines, free of ice, rocks, roots, and organic material, it may be an acceptable backfill. Such soil must be compacted in lifts not to exceed one foot to reach a final Proctor Density of 85 to 90 percent.



# STATION GRADING & HEIGHT ADJUSTMENT



What is wrong with this picture?



- Stations should be 1" to 4" above final grade with the ground sloping away from the station to provide proper venting and prevent infiltration of surface water, dirt, sand, etc.

# IMPROPER STATION HEIGHT BELOW GRADE



- Station is well below grade
- Venting is restricted
- Possible infiltration from surface water and dirt through the vents



# HEIGHT ADJUSTMENT



- E/One Extender can be used where a 6-inch height increase is needed

# HEIGHT ADJUSTMENT

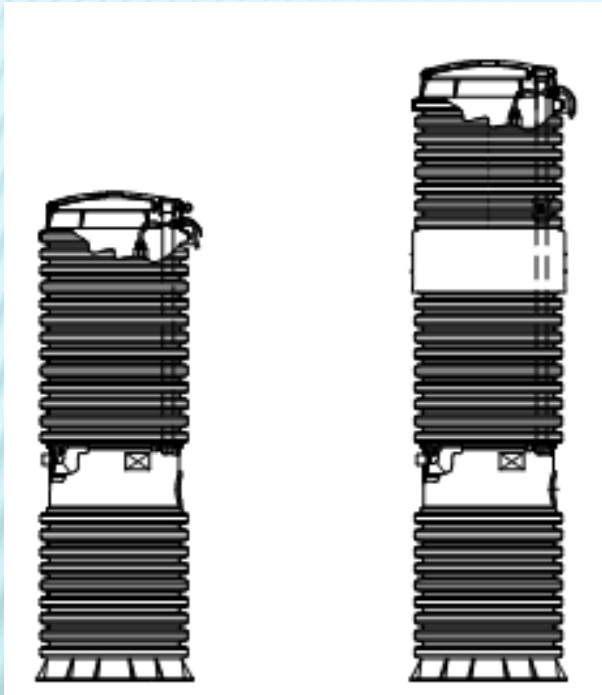


- Station heights can be increased with 1, 2 and 4\* foot risers and lowered in 3-inch increments
- Risers can be trimmed in 3 inch increments to meet existing conditions
  - \* 4 foot risers can be used with limitations. Consult your dealer.

**LIMITATIONS**  
**Due to Structural Strength**



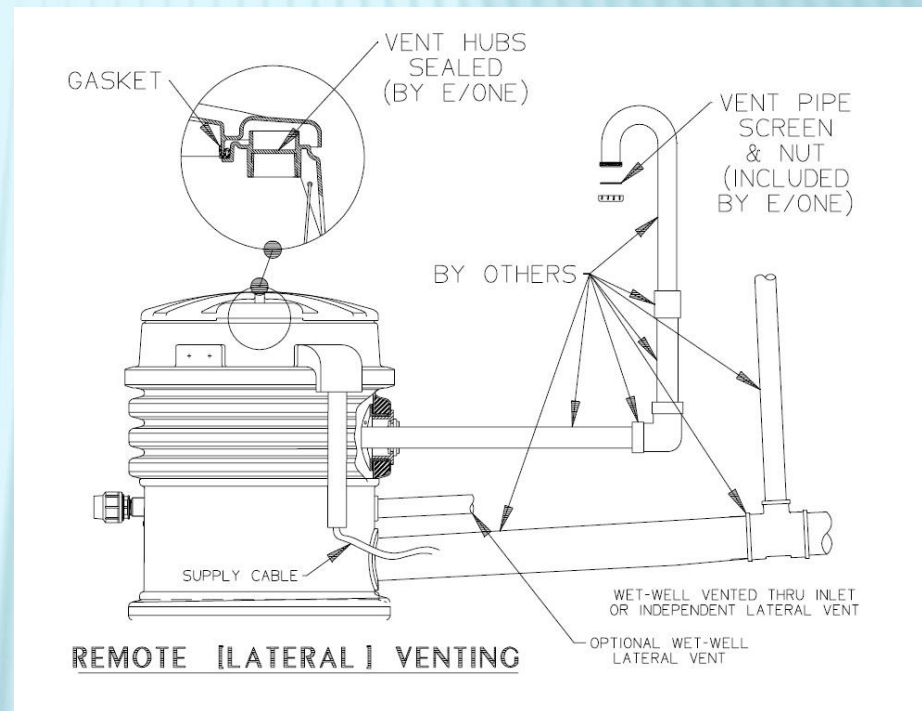
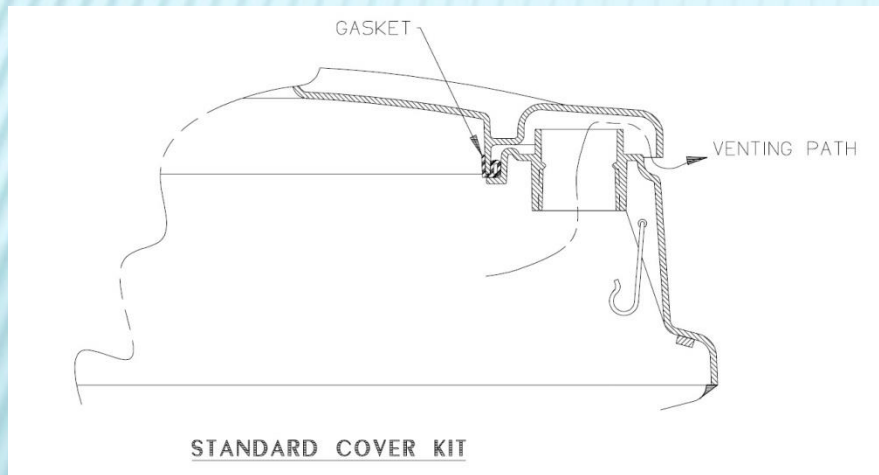
# HEIGHT ADJUSTMENT



- If a DH071 station was shipped from the factory as a -93 or less, the max height it can be extended to is 120"
- If a DH071 station was shipped from the factory greater than 93", the max height it can be extended to is 160"

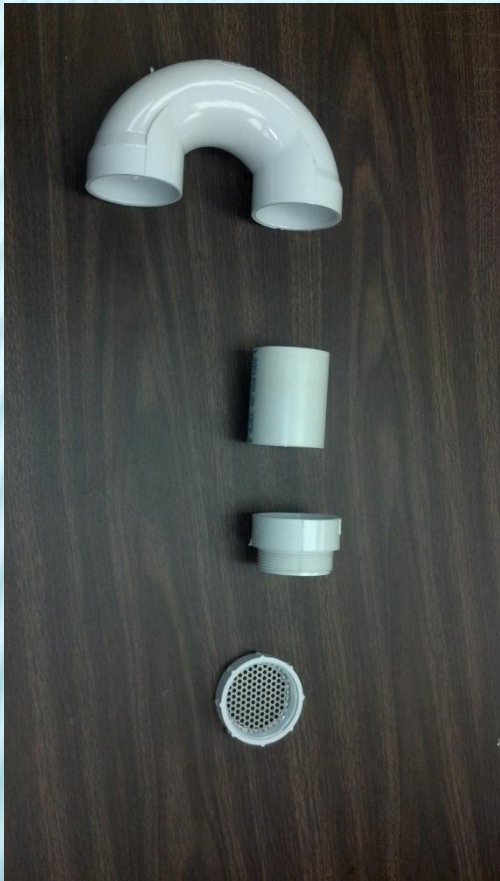
**LIMITATIONS**  
**Due to Structural Strength**

# FLOODPLAIN COVERS





# VENT CAP AND SCREEN



- ✖ Connect at end of vent riser pipe (by others)
- ✖ Can be hidden in yard as required
- ✖ Vent pipe (by others) must slope continuously upward to prevent trapped water in sags and to allow proper venting.

# DECORATIVE ROCKS



- Available in 2 sizes and 4 colors
  - 36" x 36" x 9"
  - 34" x 32" 15"
- Vented
- 4 corner stakes hold rock in place



# IH091 – INDOOR UNIT



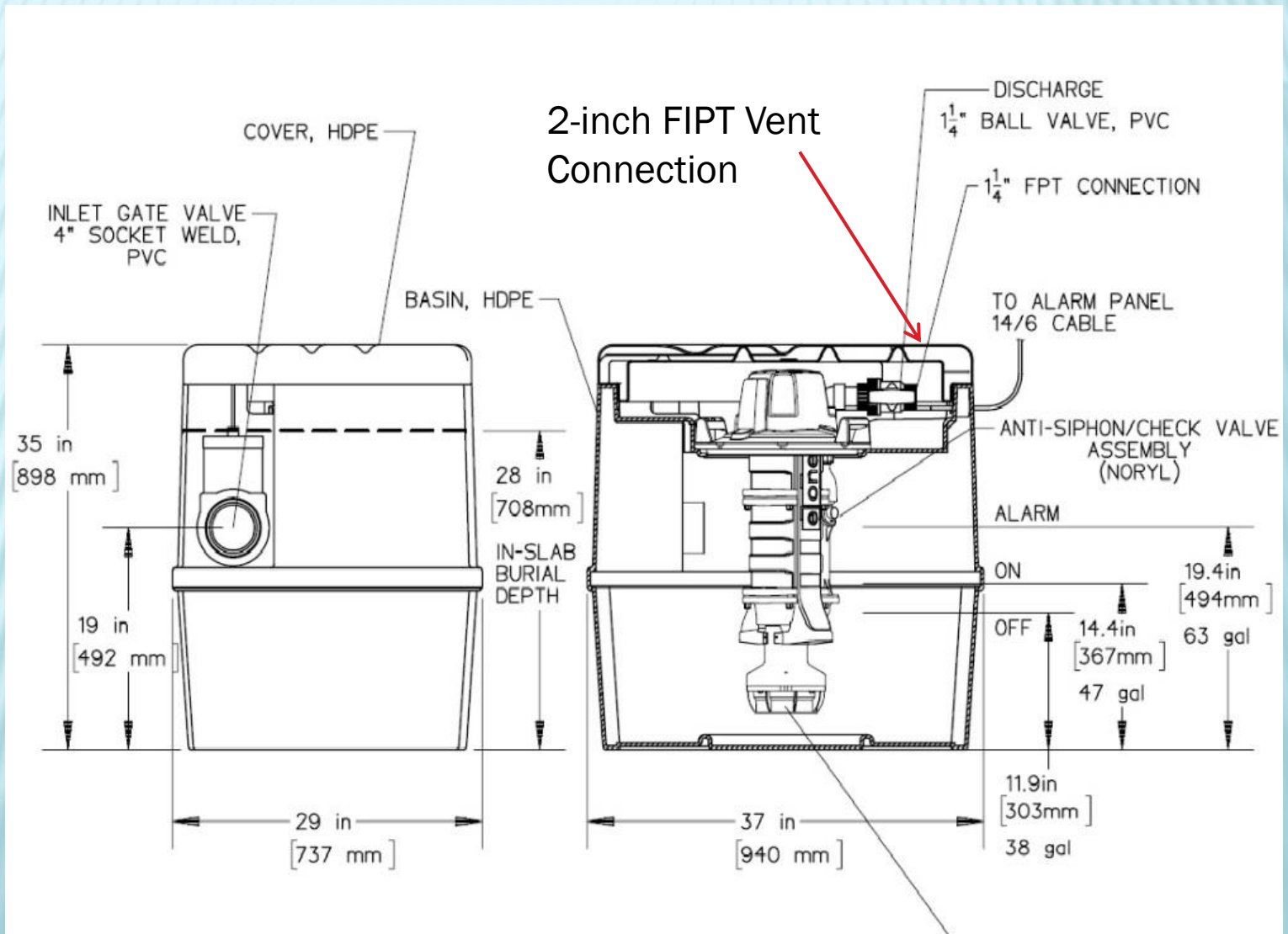
- ✖ Estimated that 12 +/- homes may require indoor units or benefit from the use of indoor stations.
- ✖ Placed in the basement floor in existing homes.
- ✖ Can be set into basement floors for “whole house plumbing”

# IH091 – INDOOR UNIT

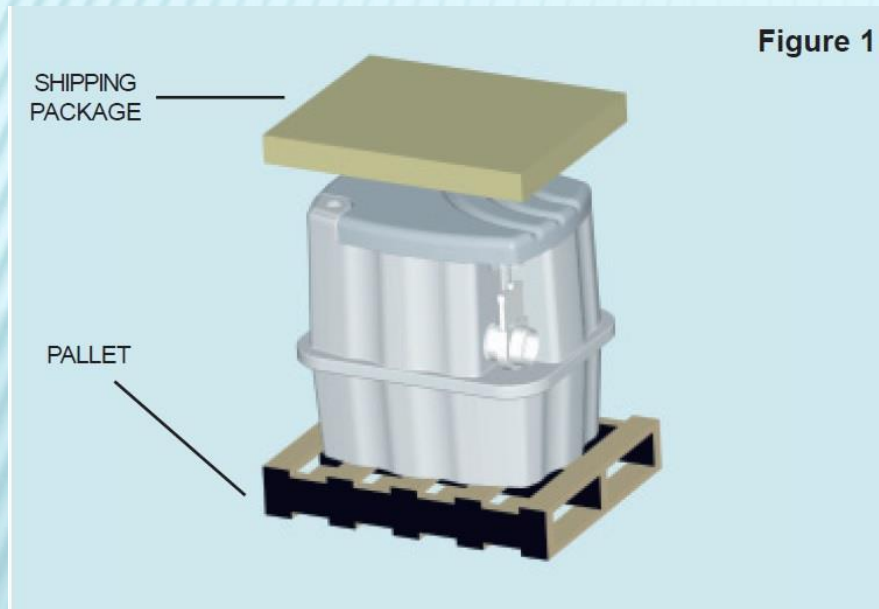
- ✖ Massachusetts Plumbing Board accepted since 1996; as are all outdoor DH stations.
- ✖ Standard warranty is 5 years
- ✖ Basin has inlet knife valve for flow control and discharge true union, ball valve.
- ✖ Basin is sealed and has connection for 2-inch vent
- ✖ **Inlet**
  - + 4-inch Socket Weld, SCHEDELE 40 is located 19-inches at centerline from the floor.
- ✖ **Discharge**
  - + 1-1/4 inch SCHEDULE 80 PVC is located approximately 37- inches from the floor.
  - + 1-1/4 inch FIPT is left for connection.



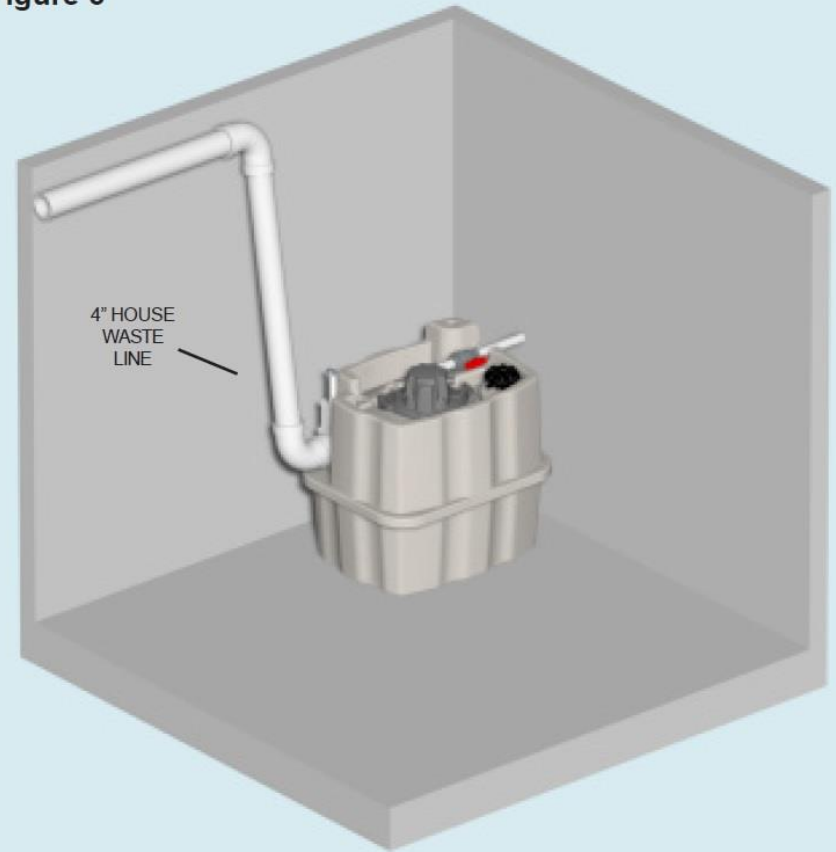
# IH091 – INDOOR UNIT DIMENSIONS



# INDOOR UNIT – TANK AND INLET PIPING



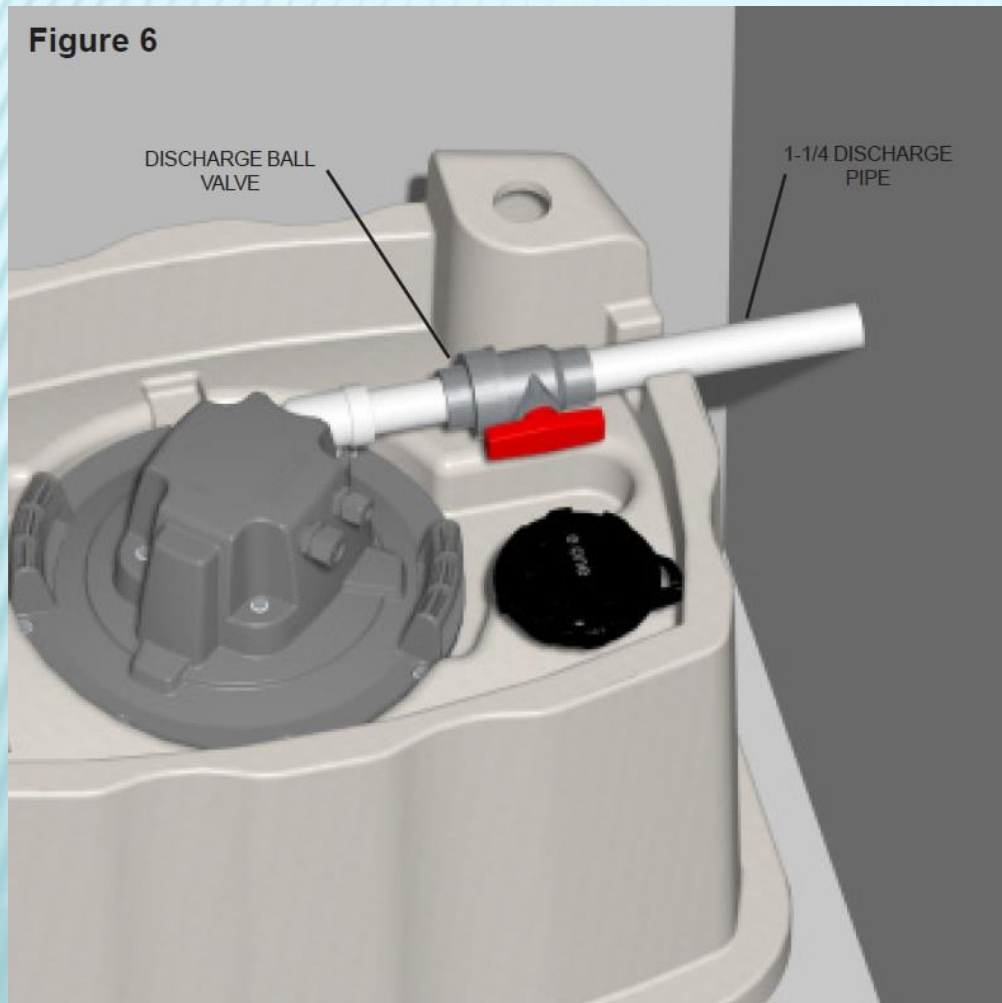
**Figure 5**





# INDOOR INSTALLATION – DISCHARGE PIPE

Figure 6



## ✕ True Union Ball Valve (Provided)

- + Install with ball valve facing the discharge side of line. (Allows stoppage of flow to isolated the pump and remove pump at union connection)
- + Rotate valve so handle is facing the front of the tank and does not stick up. (Allows top cover to fit without hitting valve)

# 248 CMR 10.00

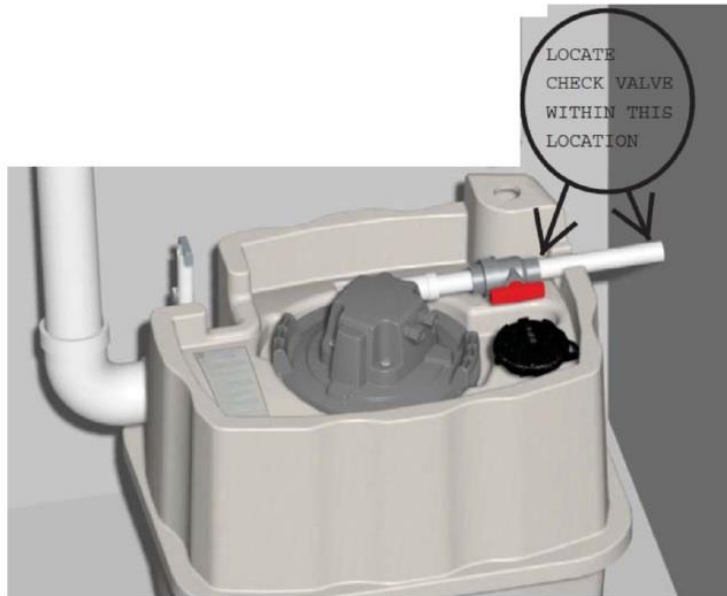
## 10.15 (7)(b)(1)(d) “Sanitary Piping Installed Through the Foundation Wall”

- d. When serving exclusively as the discharge from a semi-positive displacement grinder pump, and if so, the following shall be satisfied:**
  - i. The minimum pipe size for a semi-positive displacement grinder pump discharge shall be 1¼-inch and shall provide a self cleaning velocity of no less than two feet per second.**
  - ii. The velocity in the pipe shall not be more than seven feet per second.**
  - iii. A full port discharge valve and check valve shall be provided and made accessible inside the building.**
  - iv. The waste discharge from semi-positive displacement grinder pumps shall be protected from freezing when the piping is installed less than four feet below grade in outside locations.**



# INTERIOR CHECK VALVE LOCATION

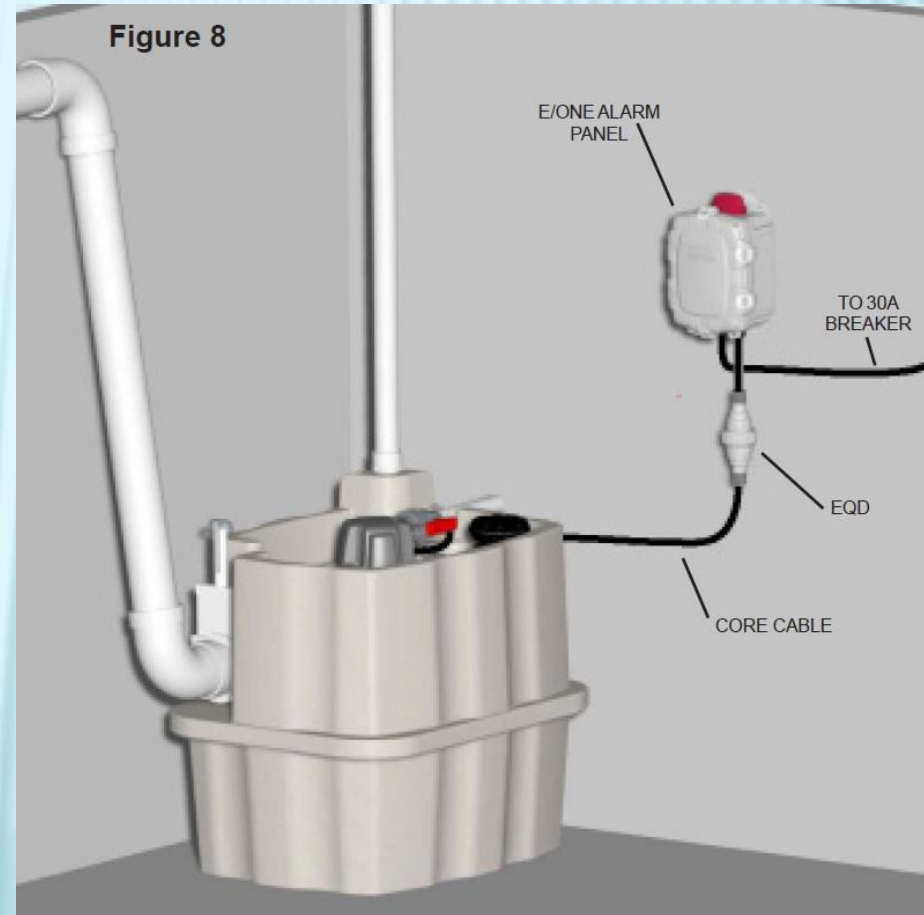
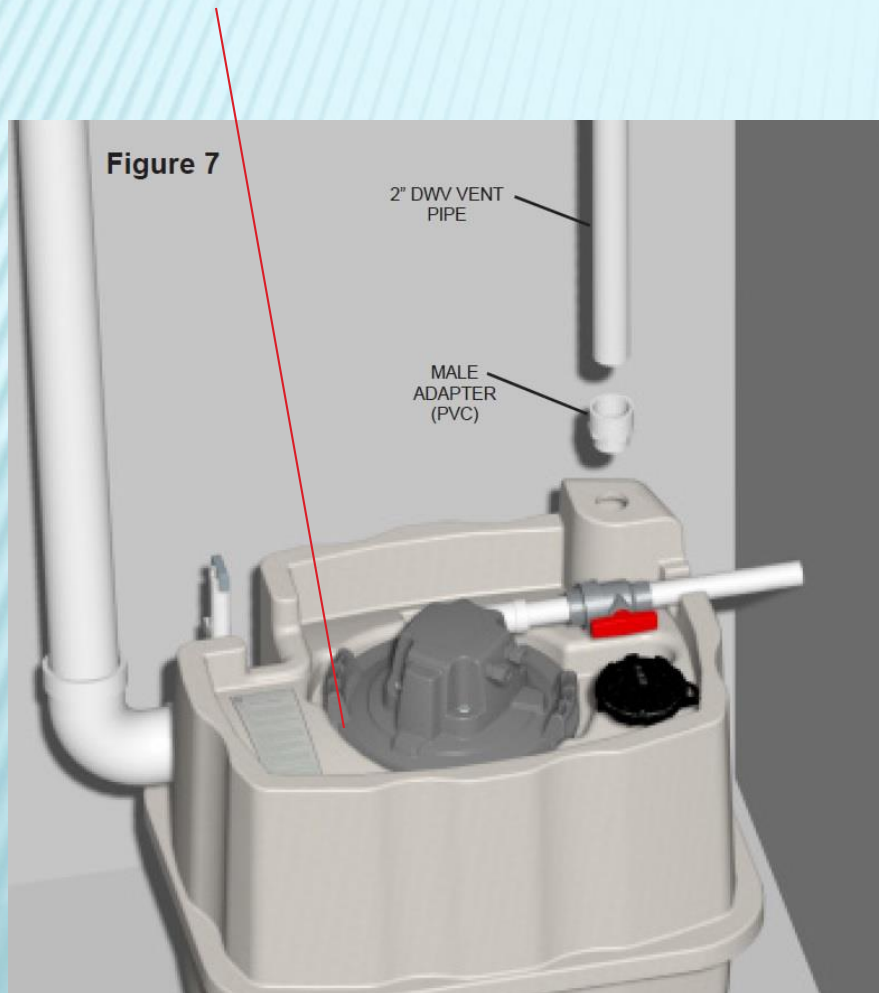
**This check valve is to be installed on the discharge line in accordance with plumbing code AND between the EONE supplied ball valve and the point of exit from the building**



- × “Accessible” check valve location.
  - + Loose parts provided by FRMA
  - + To be installed by installing plumber

# INDOOR INSTALLATION

Tighten core bolts to seal core to tank





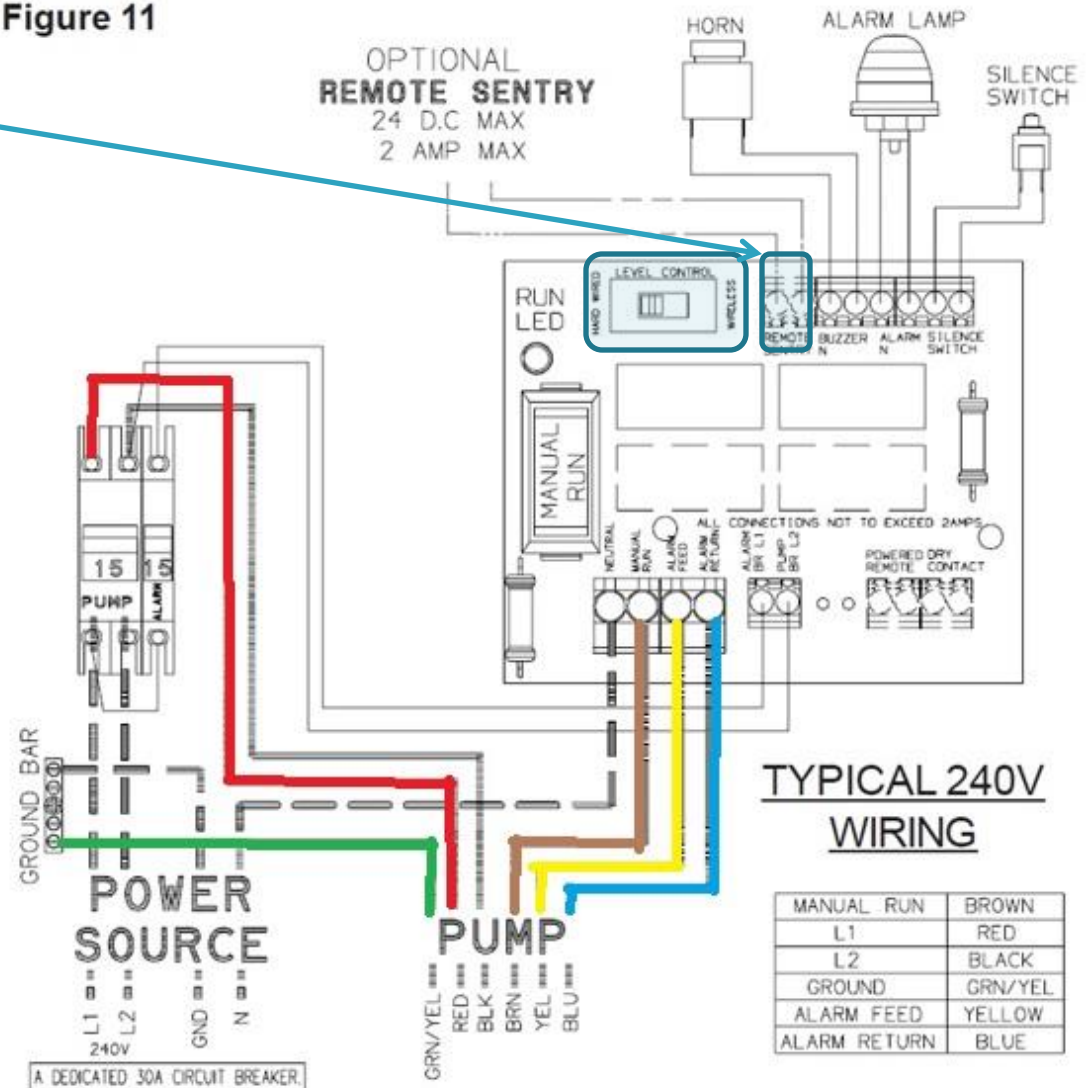
# ELECTRICAL SEGMENT

# INDOOR UNIT PANEL WIRING

Connect Remote Sentry to “Remote Sentry Contacts” as shown. These contacts are able to provide switch closure even during power failure to enable the Remote Sentry Alarm to sound.

Switch Level Control to “wired” Position

Figure 11

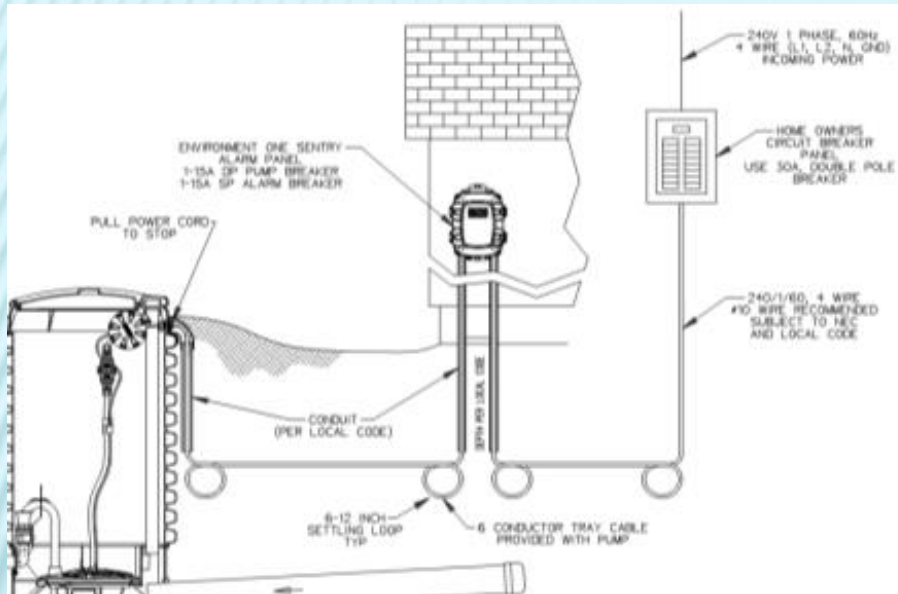




# ELECTRICAL – DH VERSUS DR SERIES

OPTIONS LISTED IN THE ONLINE AND PRINT CATALOG FOR ENVIRONMENT ONE DH071/DR071 STATIONS. WHICH DO YOU SELECT?

- ✖ The DH071 is the “hardwired” or “wired” model where a cable connects the motor controls to the level controls through watertight penetrations.
- ✖ This is the standard model sold through FRMA and is the model to be provided to Falmouth
- ✖ This allows for the use of the optional “Remote Sentry” battery powered, redundant, high level alarm module provided in the scope of supply to Falmouth
- ✖ This feature is standard in the IH091 Indoor stations
- ✖ The DR071 is the “radio frequency identification” (RFID). Or “wireless” model that uses wireless technology to communicate between the level controls and the motor controls.
- ✖ This option is not promoted in our territory mainly due to the inability to have SODC Switch over dry contacts that operate in the “Wired” model to enable the use of the “Remoter Sentry” battery powered, redundant, high level alarm module.

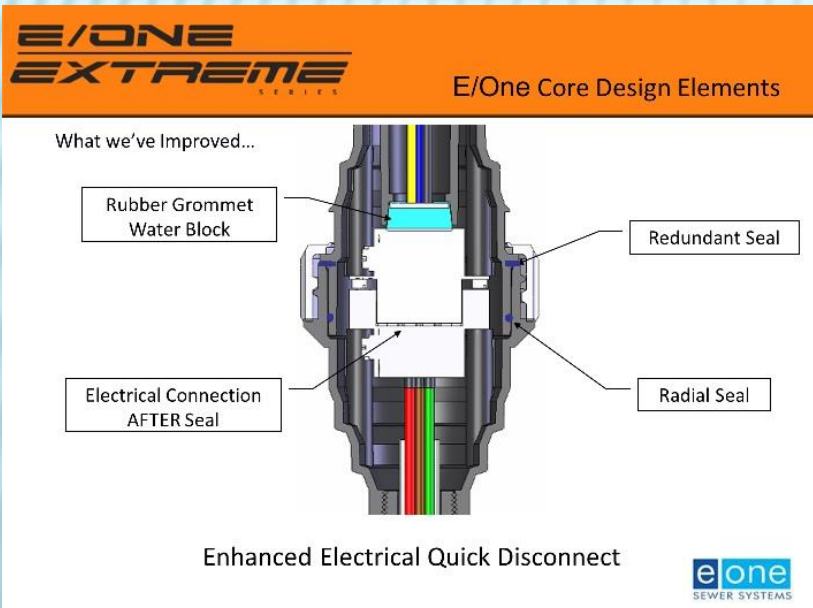


- 120 volt systems are only recommended when power supply is limited. Systems are best operated with 240 volt power.
- 208 power supplies require Buck & Boost Transformer prior to the alarm panel

- 30 amp dedicated service is recommended.
- For 240-Volt systems, 4 wires are required (L1, L2, Neutral & Ground
- For 120-Volt systems, 3 wires are required (L1, Neutral & ground



- NEMA 6P connection
  - Eliminates internal junction splice boxes
  - Radial seal
- Tool-free locking nut
  - No Screws
- Hangs at the top of the station





# OVERVIEW

## EQD & EQUALIZER



- EQD & Equalizer must be hung at the top of the station
- Easy access to pump and power supply cable eliminates confined space entry requirements



- Hangs under lid on hooks provided
- References atmospheric pressure for pressure switches to operate properly
  - Atmospheric pressure changes by feet of water, but our switches need to detect changes in inches of water
  - Need a compensation tank to account for differences in atmospheric pressure (geography & weather)
  - Maintains ambient pressure within the switch compartment



240-Volt, Single Phase power required.

- Simplex and Duplex Panels
- Audible Alarm (Buzzer)
- Audible Alarm Silence Switch
- Visual Alarm (Red Light)
- Redundant Run (In Alarm)
- Remote Sentry Contacts (FRMA)
  
- Options:
  - Emergency Generator Capabilities
  - Remote Sentry Batter Powered Alarm
  - Protect and Protect Plus Panels
  - Sentry Advisor Remote Monitoring

Environment One offers a wide variety of alarm panels with multiple options



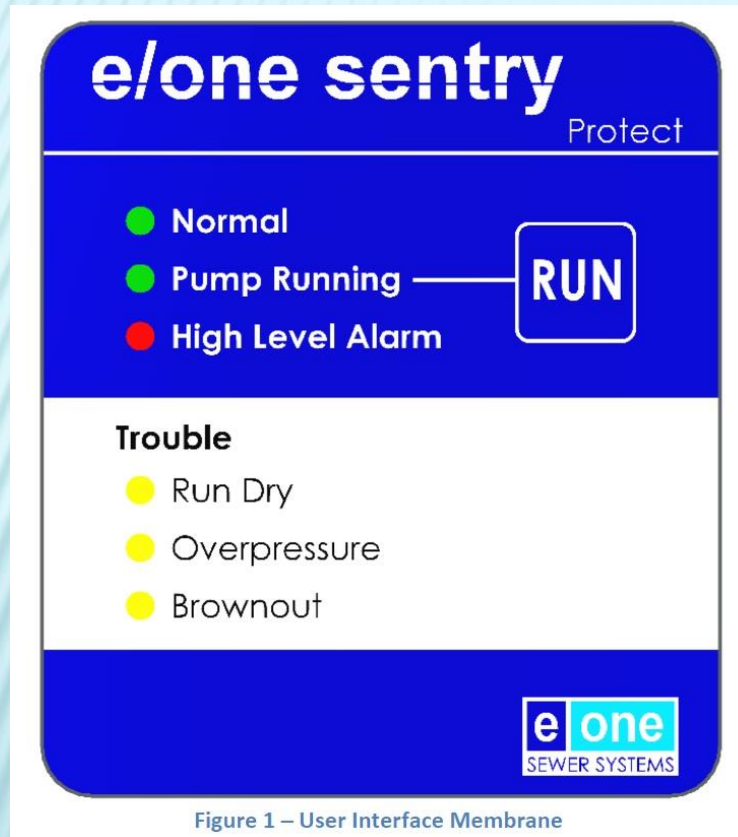
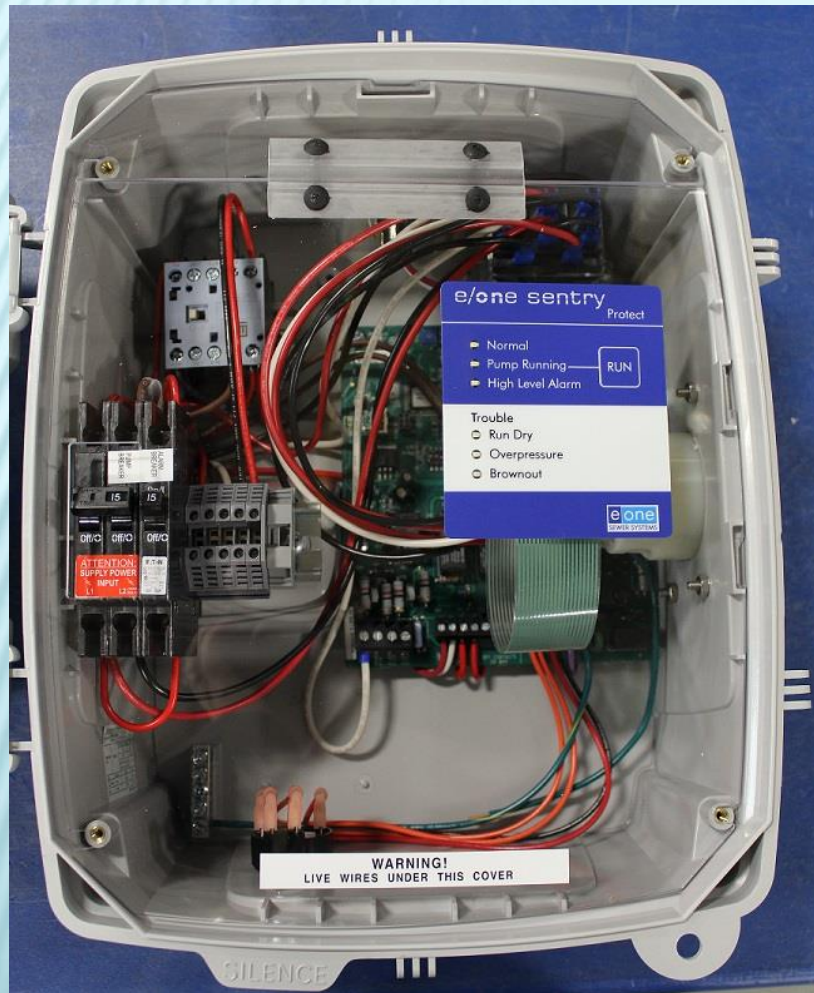


Figure 1 – User Interface Membrane

- Full Motor Protection
  - Brown Out
  - Closed Valve
  - Run Dry
  - Extended Run protection
  - Frequent starts/stops
- Complete station Monitoring
  - Alarm and trouble conditions.
  - Digital Display and programming
- Remote access to live and historical operating conditions
  - Cellular connection to secure website
  - Pump Run Cycles
  - Run Times
  - Alarm notifications
    - Local light and buzzer
    - Text, Phone, email,

## Simplex Protect and Protect Plus Panels

# FALMOUTH – ALARM PANEL



- Sentry Protect Panel
- Full Motor Protection
  - Brown Out
  - Closed Valve
  - Run Dry
- Optional Features included.
  - Generator Receptacle and Automatic Transfer
  - Remote Sentry redundant alarm panel



# FALMOUTH – ALARM PANEL



- Sentry Protect Panel
- Full Motor Protection
  - Brown Out
  - Closed Valve
  - Run Dry
- Optional Features included.
  - Generator Receptacle and Automatic Transfer
  - Remote Sentry redundant alarm panel



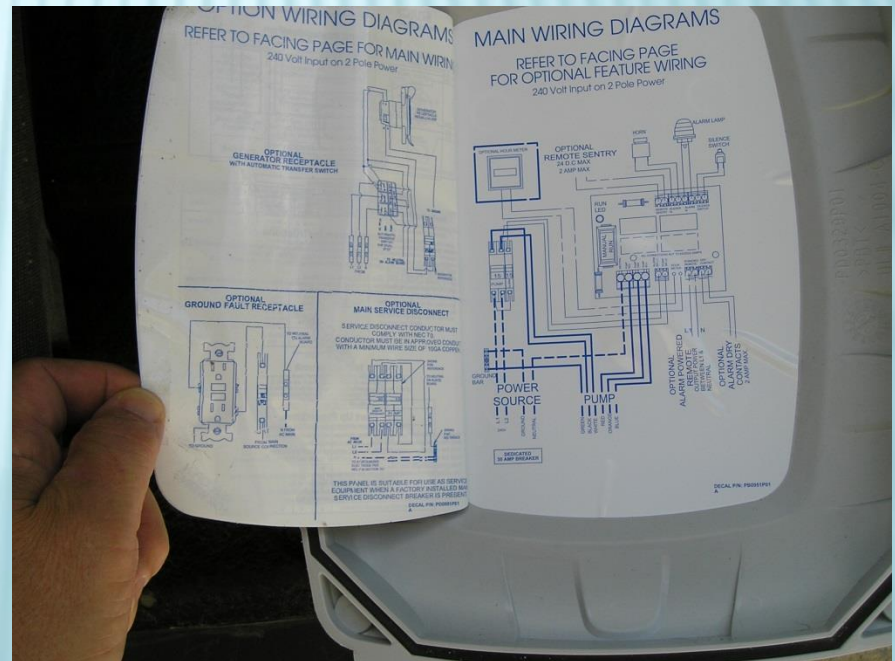
# FALMOUTH – ALARM PANEL



- **Sentry Protect Panel**
- **Full Motor Protection**
  - Brown Out
  - Closed Valve
  - Run Dry
- **Optional Features included.**
  - Generator Receptacle and Automatic Transfer
  - Remote Sentry redundant alarm panel

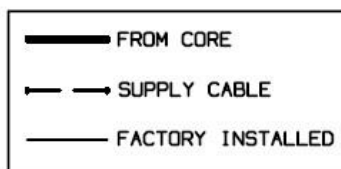
# WIRING INSTRUCTIONS

- ✖ Supplied in Installation instruction booklet inside the access cover of every pump.
- + Generic to basic panel
- + Use 240-volt diagram for pumps to be supplied to Falmouth.
- ✖ Typical standard in N.E.
- ✖ 120-Volt systems are very rare.
- ✖ Inside the alarm panel door. Peel back label that has specific wiring instructions.





### LEGEND



POWER SOURCE

FROM L1  
AC L2  
MAIN L2  
NEUTRAL  
GROUND

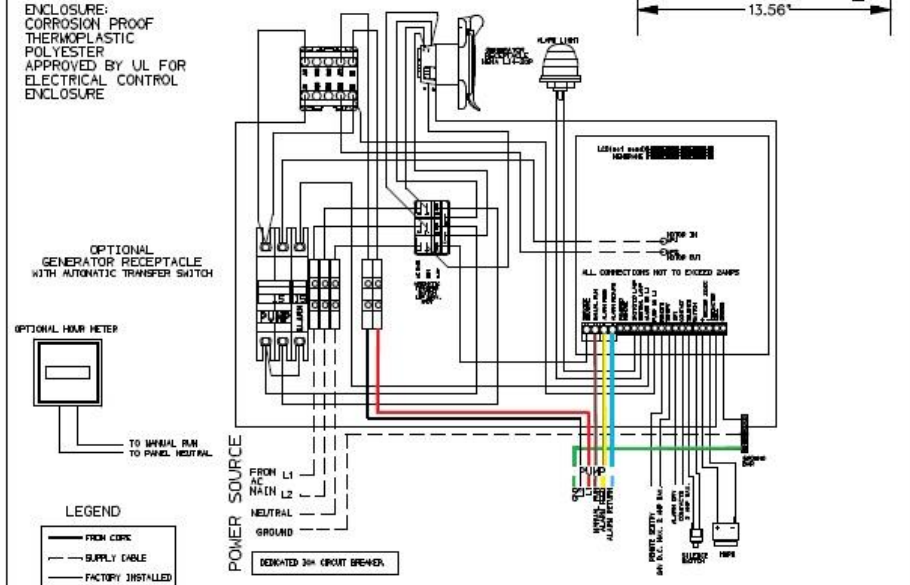
DEDICATED 30A CIRCUIT BREAK

PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	<b>L2</b>	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

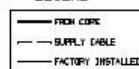
## SENTRY PROTECT SIMPLEX

REDUNDANT RUN (HIGH LEVEL)  
EXTERNAL VISUAL & AUDIBLE ALARM  
REMOTE SENTRY DRY CONTACTS FOR  
OPTIONAL POWER LOSS HIGH LEVEL  
ALARM (POWER LOSS ALARM FOR WIRELESS)  
MANUAL ALARM SILENCE  
MANUAL RUN  
STATUS LED'S: NORMAL, PUMP RUNNING, HIGH LEVEL  
TROUBLE LED'S: RUN DRY, OVERPRESSURE, BROWNOUT  
DRY CONTACTS  
CONFORMAL COATED CIRCUIT BOARD (BOTH SIDES)  
PADLOCK  
DEAD FRONT  
NEMA 4X ENCLOSURE ASSEMBLY

ENCLOSURE:  
CORROSION PROOF  
THERMOPLASTIC  
POLYESTER  
APPROVED BY UL FOR  
ELECTRICAL CONTROL  
ENCLOSURE



LEGEND

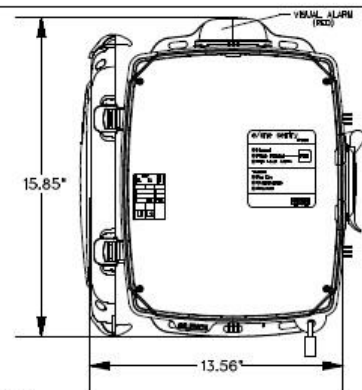


PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	L2	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:  
TYPE TC: DIRECT BURIAL, 12AWG,  
SIX CONDUCTOR



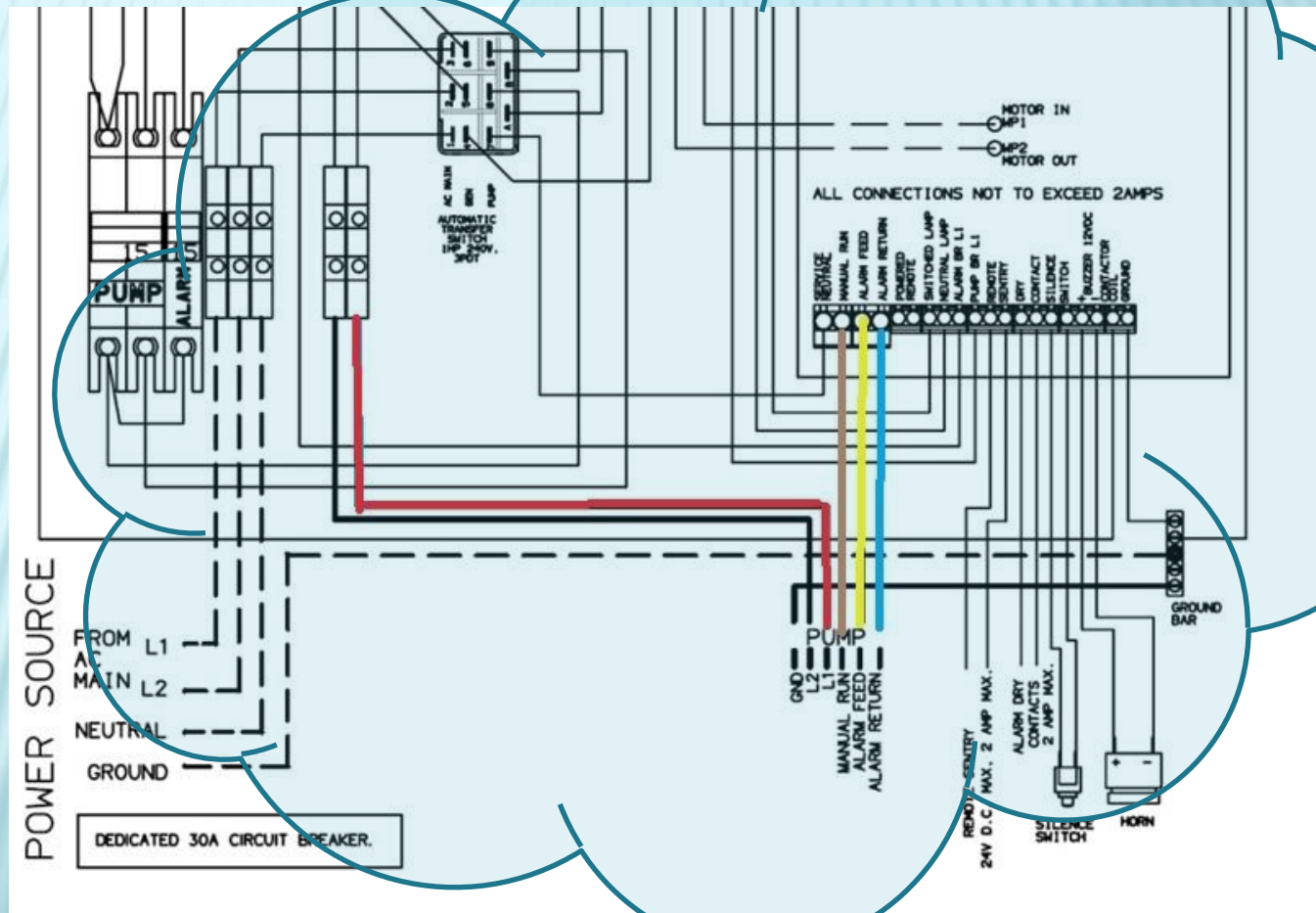
LISTED 505D



SGS	09/25/08		3	12/03/13
DR BY	DATE	CHK'D	ISSUE	DATE
 <b>SEWER SYSTEMS</b>				
SENTRY SIMPLEX PROTECT PANEL, 240V 60Hz W/GENERATOR RECEPTACLE				
ESD 08-0122				



# PROTECT PANEL – PUMP CABLE CONNECTIONS

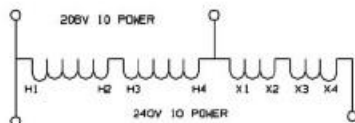


Catalog Number : 9T51B0129



**Features :**

- Line: 120 x 240 Vac
- Load: 16/32 Vac
- Single Phase, 0.75 kVA
- 100 degree rise, Copper
- Buck Boost Application
- No Electrostatic Shield
- QB, 60Hz



**Dimensions (Inches) : 9.62H x 7.88W x 5.5D x 25lbs**

Buck-Boost Transformers.

**Introduction**

The Buck-Boost transformer is a very versatile product for which a multitude of applications exist. In its simplest form, these transformers will deliver 12, 16, 24 or 32 volts when their primaries are energized at 120 or 240 volts.

Their prime use, however, lies in the fact that the primaries and secondaries can be **interconnected**, thus permitting their use as an autotransformer. When the primaries and secondaries are connected together so that electrical characteristics are changed from a two winding transformer to those of an autotransformer, the units can economically 'buck or boost' voltage up to +/- 20%.

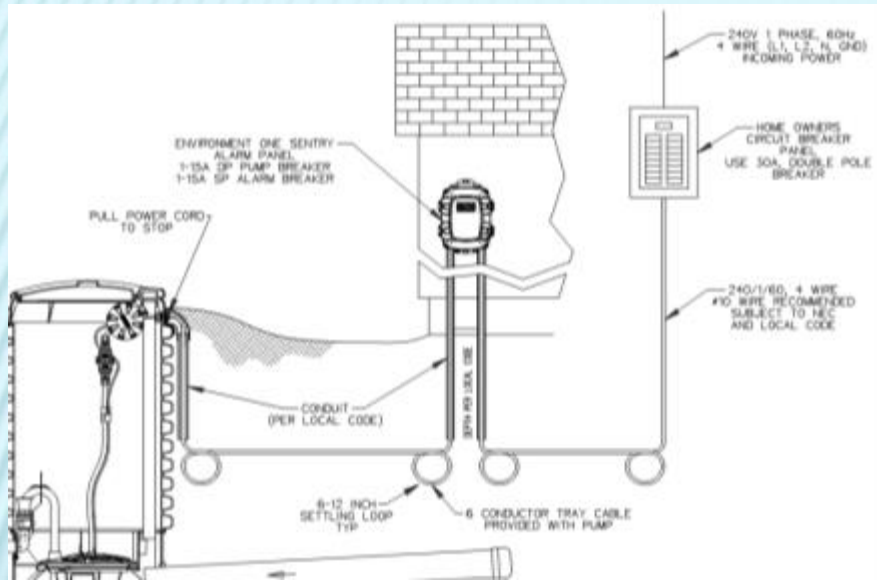
For use with e|one Duplex Panels

Single Phase Load: 16/32 Vac  
Non-Vented (NEMA 3R)  
Enclosure  
Buck Boost

DR BY: SGS	DATE: 4/30/2001	 ENVIRONMENT ONE CORPORATION <b>TRANSFORMER, BUCK BOOST</b> <b>0.75KVA, PA0219P03</b>
CHKD BY:	DATE:	
ENG BY:	DATE:	
APP'D BY:	DATE:	
SCALE: FULL		MATERIAL:
		PART NUMBER:
		PART
		<b>LM000230</b>
TYPE: 4	CLASS: 06	DWG NUMBER
		SHEET 1 OF 1
		REV

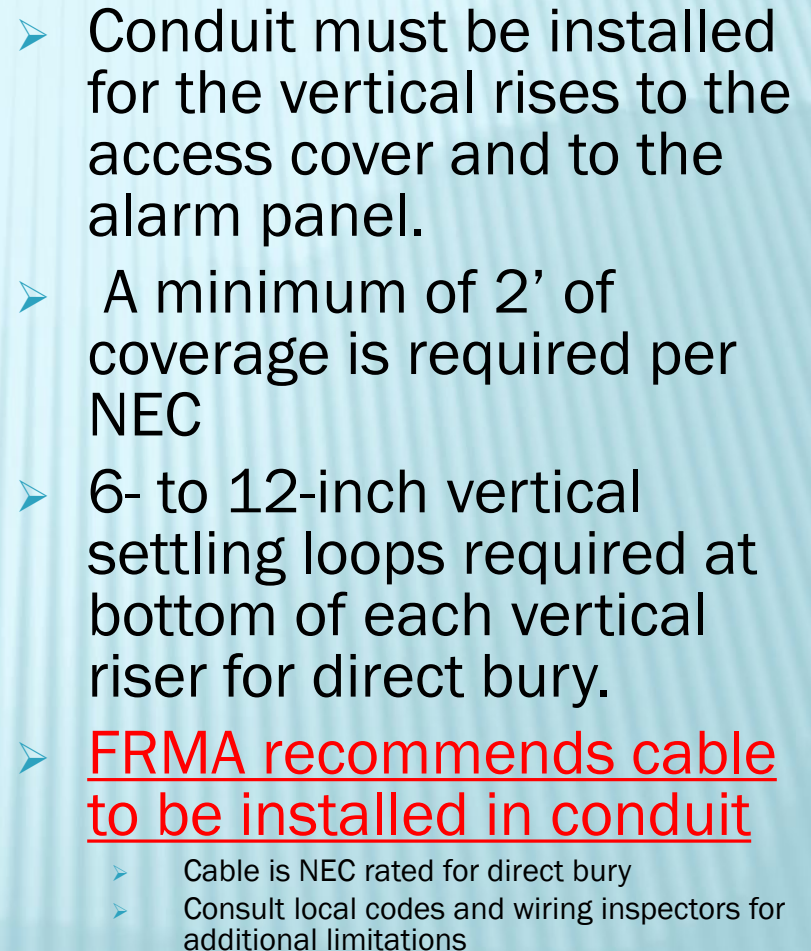
- 208 Power supply systems require a Buck & Boost Transformer
- FRMA can supply units for this.
- Transformer must be located near the power supply prior to the alarm panel feeder
- Typical uses are commercial buildings or schools that may be supplied with 208 power supplies.
- Measure voltage once installed. Higher power leg should go to the pump load leg (Black L2) and NOT to alarm jumped leg.

# ELECTRICAL – CABLE & CONDUIT



- Use only the cable provided
- Do not splice underground cables
- Standard length is 32 feet
  - Additional lengths available – 50, 75 and 100 feet
- Cable is NEC rated for direct burial.
- We recommend cable to be installed in conduit whenever possible





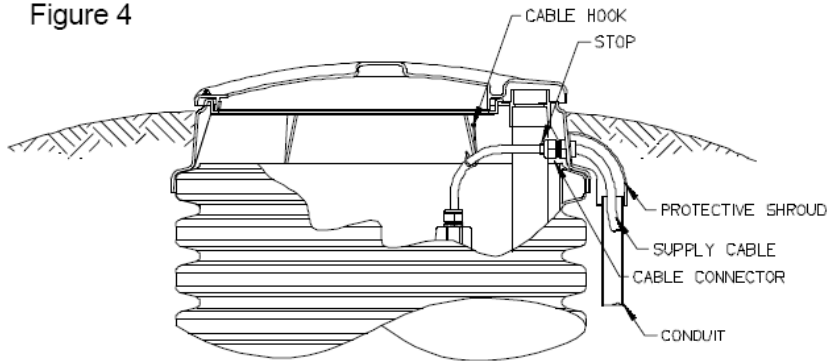
# ELECTRICAL – TANK CONNECTIONS



- Pull all of the cable out of the station until you reach the stop
- Tighten the Liquid Tight Cord Grip
- Install the cable shroud on HDPE stations
- **Do Not** penetrate the basin with conduit – Use provided tank penetration and cord grip

# CABLE PENETRATION

Figure 4



Power at the station must not drop below 10% of nameplate voltage. Maximum Recommended Length:  
120 Volt 60' (min. voltage at pump — 108V)  
240 Volt 150' (min. voltage at pump — 216V)  
Consult factory for longer lengths

- ✘ Conduit ends under cable shroud (provided)
- ✘ Do NOT make penetrations in the tank
- ✘ Tighten cord grip to assure watertight penetration.
- ✘ Verify that cord grip nut and O-ring are secure on inside of tank.
- ✘ Verify that EQD is securely tight and hanging in the proper position.



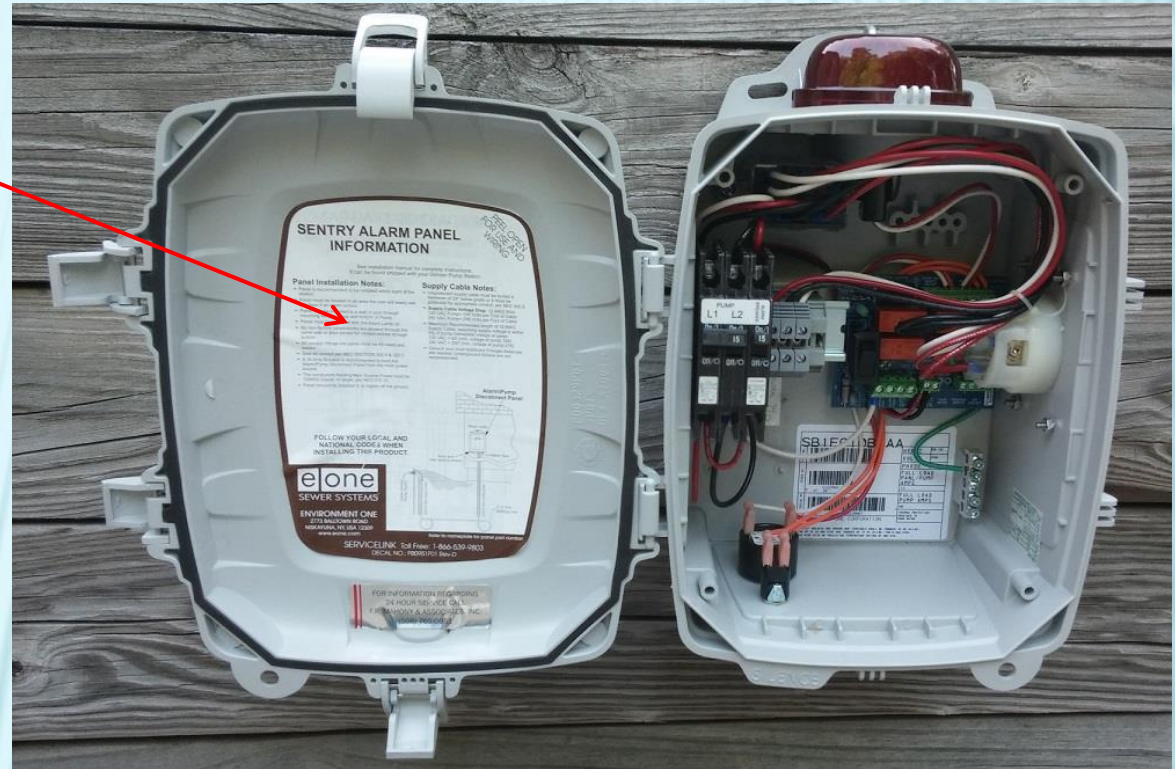
# PANELS – RATING & LOCATION



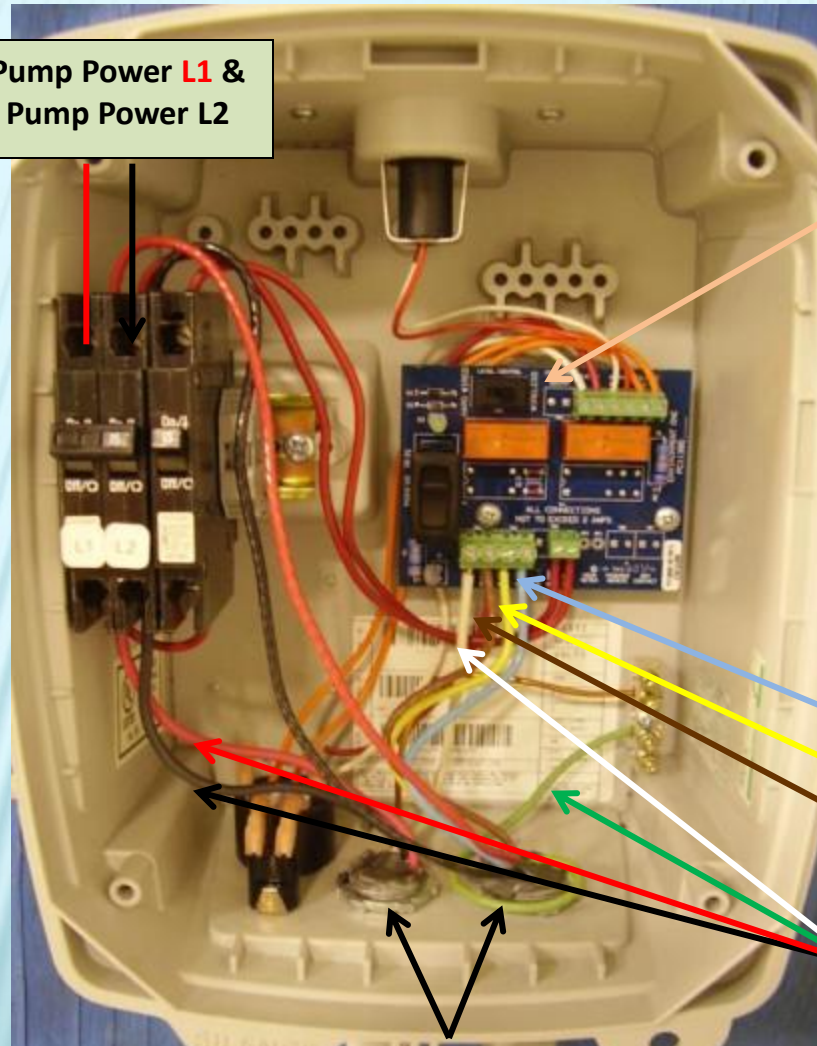
**This panel has improper rear penetration for power**

- All stations are provided with a NEMA 4X alarm panel
- Minimum mounting height of 36 inches
- Alarm panels must be located within sight of the pump, mounted on the building or on a suitable pole

- Wire Alarm panel following the provided instructions located on the inner panel door
- Failure to follow wiring instructions will void warranty
- Instructions include:
  - Panel height and location
  - Proper Panel Penetration
  - Correct Wiring Orientation
  - Power feeder, size and amperage requirements







Pump Power **L1** &  
Pump Power **L2**

Hard Wired / Wireless switch in  
correct position

Panel mounted securely  
4' to 5' off of the ground

Manual Run, **Alarm Feed**, **Alarm Return**  
in correct terminal

Four wires from source: **L1**, **L2**,  
Neutral (white wire) & **Ground**

Bottom penetrations only and conduit sealed with duct seal



# IMPROPER PANEL INSTALLATION



- Panel is penetrated in the back for source power
  - Potential leak path
- Conduit is not sealed
  - Possible moisture and insect pathway

**Remote Sentry Option for alarm during normal and power loss. Sold standard for models IH091 indoor units and standard for DH stations in Falmouth.**

## **ALARM PANEL OPTIONS included**

- **Protection Package**, consisting of:
  - Brownout Protection w/ Trouble Indication
  - Run Dry Protection w/ Trouble Indication
  - High System Pressure Protection w/ Trouble Indication
- **Alarm Activated Contacts for Remote Indoor Alarm Module**
- **Remote Sentry Indoor Alarm Module** – A separate, remote indoor alarm module shall be provided to indicate a high level alarm with or without AC power to the grinder pump station. The Remote Sentry indoor alarm module shall have an internal power source enabling its continued operation without AC power. The Remote Sentry shall have an audible alarm and a visual alarm, both of which shall automatically reset if the high level alarm condition is eliminated. The Remote Sentry indoor alarm module shall include a Silence button for the audible alarm and a Test button.



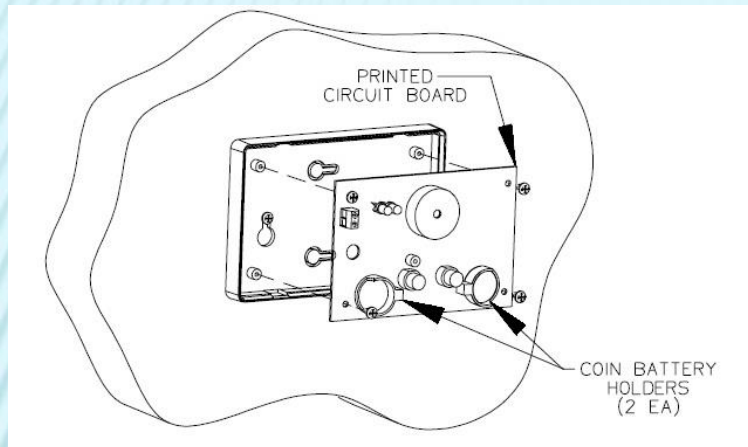
Remote Sentry Option for alarm during normal and power loss. Sold standard for models IH091 indoor units and standard for DH stations in Falmouth.

**THE E/ONE REMOTE SENTRY DISPLAY MODULE** provides visual and audible indication when the water level inside the grinder pump tank reaches a predetermined “high” level during normal operation, or in the event of a power outage (with hard-wired version of *Extreme* core and optional contacts in panel). It is ideally suited for installations where the outdoor alarm panel location is obstructed from view, or where an Indoor Unit (IDU) installation is isolated in a utility room.

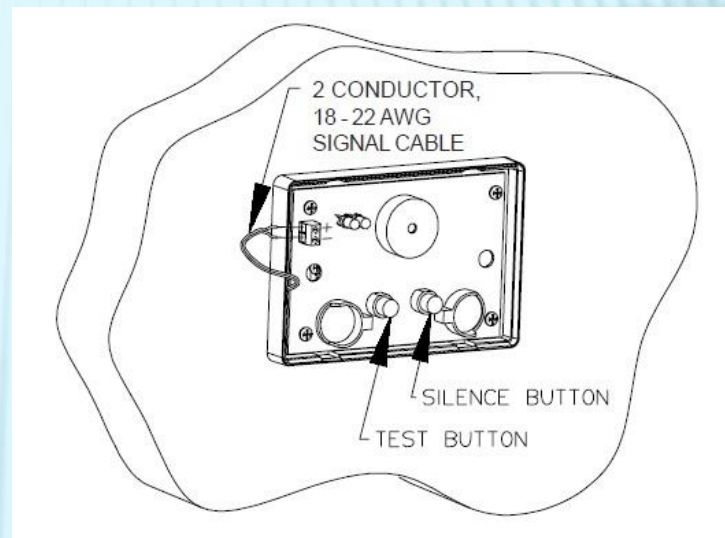
**The Remote Sentry includes:**

- A low profile attractive case (5.4”W x 3.69”H x 1.25”D)
- Lithium battery
- Audible alarm (70dB)
- Push-to-silence audible alarm switch
- Push-to-test visual and audible alarm





Battery replacement (4) CR2032



Run a 2-conductor, 18-22 AWG electronic signal cable that is UL-rated for 300 volts from the alarm panel to the wall location of the E/One Remote Sentry. Connect the cable to the contacts for Remote Sentry or to Dry Contacts (DC) in alarm panel. (Note: If DC's are used, the Remote Sentry will not work in a power loss situation)

Note: This connection has no polarity, unless connecting to an Indoor Unit (IDU), Red = (+), Black = (-), see PA1730P01.



# REMOTE SENTRY - FEATURES

- ✖ Provides redundant alarm for homeowner when the station has power or when power is out
- ✖ Provides additional alarm in living space that can be heard by residents.
- ✖ Drop down door allows access to silence and test buttons as well as user instructions during power loss.
- ✖ Silencing this panel will not silence the Sentry Protect Panel. This is done separately.
- ✖ Requires the electrician to wire the unit in the home.
- ✖ Requires 18-22 gauge “door bell” type twisted pair wire.
  - + 100 feet supplied with IH091 standard
- ✖ Requires that the internal battery be changed on routine basis to be functional.
  - + Change batteries at daylight savings time when you change batteries in smoke and CO<sub>2</sub> detectors.
  - + Battery replacement (4) CR2032 available at local hardware stores

# NOT SO REMOTE SENTRY





# START UP INSPECTION

- ✖ Mandatory for all stations
- ✖ Failure to call for or pass inspection may void the warranty
- ✖ Last opportunity to make corrections to avoid unnecessary service calls.
- ✖ Inspections provides for more reliable system operation and consumer confidence.
- ✖ This is a team effort.
- ✖ You do not get a discount or credit for avoiding a startup.
- ✖ You may be charged extra for repeated inspections if corrections are not made in timely manner. While rare, this can occur in some cases.
- ✖ We are here to work with and for you. We simply ask for your cooperation to make all installations successful.

# STARTUP INSPECTION

Call 508-765-0051 at least 24 hours  
in advance to schedule startup  
inspection.



- Startup is included in the cost of pumps sold through FRMA
- Installers must call 24 hours in advance to schedule
  - Power is connected
  - Discharge is connected
  - Available sewage flow or water supply
  - Station is backfilled and ready for use
    - Backfill, wiring and pipe inspections are performed locally to meet local codes
- Inspection reports are sent to the owner or installer with acceptance or deficiencies
  - Repeat inspections may be subject to additional charges
  - Emergency service calls may take precedence over startup inspections



DATE:		ADDRESS:	
OWNER:			
INSTALLED BY:		ADDRESS:	
Ph #			
INSPECTOR:	SN:	Panel #	TYPE/SIZE

Yes OK	No Not OK	Start up check list = first inspection	= Follow up	Type of problem found& action taken	Date resolved time spent
		Start up by house or generator?			
		Is grade finished?			
		GP backfill too high or low?			
		Does grade drain away from GP?			
		Does the unit appear damage free?			
		Does the unit appear to be leak free?			
		Is station vented properly?			
		Is access way clean and dry?			
		Power cable connection tight?			
		Is cable breather hung up?			
		Is power cord sleeved in conduit at tank?			
		Are all valves open?			
		Discharge ball valve handle over u-tube?			
		Discharge pipes and valve pressure rated?			
		Discharge Union?			
		Any visible problems with panel?			
		Wiring to NEC?			
		Is feeder to panel 30 amps?			
		Is it wired per schematic?			
		Continuity test			
		Turn on alarm circuit breaker			
		Does horn sound?			
		Does "push to silence" button work?			
		Does alarm light work?			
		Is alarm light tight?			
		Is Conduit sealed?			
		Turn on pump circuit breaker			
		Volt _____ amps _____			
		(220-240) (5.5-6.5)			
		Did the alarm shut off properly?			
		Leave both breakers on if all is OK			
		Does access cover fit properly?			
		Lock both panel and GP			
		Remote sentry installed?			
		FRMA remotes sentry test			

Notes:

X

Signature

Action required = Deficiency letter to installer = Schedule further service = Schedule repeated start up

\* May cause damage to pump that will not be covered by warranty

\*\* will cause damage to pump. Pump station is not in warranty

NA = not applicable to this pump model

OEM= supplied by factory

Molded top OR Band clamp

# STARTUP INSPECTION

- Startup is included in the cost of pumps sold through FRMA
- Installers must call 24 hours in advance to schedule
  - Power is connected
  - Discharge is connected
  - Available sewage flow or water supply
  - Station is backfilled and ready for use
    - Backfill, wiring and pipe inspections are performed locally to meet local codes
- Multi-point inspections
  - Some communities require copies prior to sign off of sewer connection permits.

Call 508-765-0051 at least 24 hours in advance to schedule startup inspection.

- Congratulations!
  - You are now Level 1 Certified for Installation
- To achieve Level 2 Certification, log on to:  
[www.coursesites.com](http://www.coursesites.com) and take the short quiz
  - For login credentials, contact:
    - Jim Welsh: [jwelsh@eone.com](mailto:jwelsh@eone.com) or 518-579-3066
    - Brian Waghorn: [bwaghorn@eone.com](mailto:bwaghorn@eone.com) or x3216